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Helping students make sound judgments is a common teaching goal for faculty members. This chapter explains how students' approaches to making judgments are grounded in their assumptions about knowledge and how it is gained.

Learning to Make Reflective Judgments

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Professors take great pride in encouraging students to think in more informed, subtle, and sophisticated ways. Cultivating good thinking is one of the most rewarding and important outcomes of teaching, for good thinking is a truly generalizable skill that students can use in many contexts beyond the confines of one course, one field of study, or one major decision. This is also a challenging undertaking. For example, consider the following exchange, which was overheard between a professor and a student in a history class.

PROFESSOR: Class, today we continue our discussion of the Renaissance.

This was such a remarkable era! It's sustained my scholarly interest for my whole career, and I hope you will find it equally stimulating and rewarding to study. Before we begin, are there any questions from our last class?

STUDENT: Yes, I think I followed everything from last time, but I just can't seem to find in my notes when the Renaissance started.

PROFESSOR: Oh, that is a very good question! You see, the Renaissance in northern Italy really took hold at a different time and in a different context than the Renaissance in the south. This is important because—

STUDENT (*interrupting*): Sir, I was hoping you could answer my question *before* you got started today.

PROFESSOR: Yes. In determining when the Renaissance got started, it's also important to recognize that this "awakening" covered many aspects of people's lives. Why, the scientific Renaissance and the ideas of Leonardo da Vinci had such tremendous potential, made ever richer by the emergence of the artistic Renaissance and artists such as Michelangelo and

STUDENT (*interrupting and now irritated*): Sir! *Before* you start today's lecture, could you please just state when the Renaissance began?

PROFESSOR: April 14, 1363.

STUDENT: Thank you, sir. That's all I wanted to know.

Such exchanges show the frustrations and misunderstandings that can emerge when there is a wide discrepancy between students' and professors' expectations about courses and what should happen there. Both hold many expectations about teaching and learning, reflecting their prior experiences and their personal philosophies. These expectations reflect what they think is important to learn, how it should be learned, who has what responsibilities in the teacher-student relationship, how much time and energy should be devoted to the course, and so on.

One important element that underlies expectations about the teaching and learning process is the assumptions a person holds about knowledge and how it is gained; these are termed *epistemological assumptions* because they are based on the area of philosophy called epistemology, the study of the nature and origin of knowledge. (For a recent compilation of theory and research on epistemological theories, see Hofer and Pintrich, in press.) Many students report that they "learned how to think" in college; cognitive psychologists and higher education researchers (Pascarella and Terenzini, 1991; Hofer and Pintrich, 1997; Tsui, 1999) have conducted studies confirming that many students do show gains in critical thinking during college. The remainder of this chapter will focus on one line of research that has documented development in reasoning during the college years based on changes in epistemological assumptions, research on the Reflective Judgment Model (King and Kitchener, 1994, in press). This model of late adolescent and adult intellectual development is grounded in John Dewey's work (1933, 1938) on reflective thinking. Reflective thinking is necessary when a person wants to come to a judgment (a "reflective judgment") about a problematic or vexing issue that cannot be answered by formal logic alone. This model shows how people's epistemological assumptions are related to the ways they reason about controversial issues.

The Reflective Judgment Model

Many professors endorse two interrelated goals for students: (1) to evaluate knowledge claims more fully and (2) to explain and defend their points of view on controversial issues more convincingly. The Reflective Judgment Model can be used to help faculty understand the steps that students often take to achieve these goals. This model describes a developmental progression that occurs between childhood and adulthood in the ways that people understand the process of knowing and the certainty of knowledge claims and in the corresponding ways that they justify their beliefs.

The following verbatim comments were made in a discussion of the controversy surrounding the safety of food additives. (Examples are from Lynch, Kitchener, and King, 1994, pp. 83–85; "I" stands for interviewer and

"R" for respondent.) Each comment reflects one of the three major categories of thinking styles in this model: prereflective, quasi-reflective, and reflective thinking.

Example of Prereflective Thinking

Certainty of Knowledge

- I: Can you ever know for sure that your position that NutraSweet is safe is correct?
 R: No, I don't know for sure because I don't manufacture it.
 I: OK. Do you think we'll ever know for sure?
 R: If somebody more or less has the guts to stand up and go and do all the research on it and find out.
 I: Do you think someday we'll know?
 R: Yes.

Justification of Beliefs

- I: When people differ about the safety of NutraSweet and matters like this, is it the case that one opinion is right and the other is wrong?
 R: Some people's opinions are right, and they can more or less prove that they are right, and the other people that think they're wrong maybe can't prove it.
 I: So you think that some people indeed are right?
 R: Yes.
 I: And "right" in what way? What do you mean by "right"?
 R: They can back their opinions, have the facts to show that they are right.

Students who hold epistemological assumptions associated with prereflective thinking believe that knowledge is gained through the word of an authority figure (such as a scientist, a priest, or a professor) or through first-hand observation. The use of evidence is not a salient characteristic of reasoning at this level. These individuals believe that what they know is absolutely correct and that they know it with complete certainty. They do not often acknowledge the problematic aspects of what for others is a vexing issue.

Example of Quasi-Reflective Thinking

Certainty of Knowledge

- I: Can you ever say you know for sure that chemicals are safe?
 R: No, I don't think so.
 I: Can you tell me why you'll never know for sure?
 R: Because they test them on little animals, and they haven't really tested them in humans, as far as I know. And I don't think anything is for sure.
 I: When people differ about matters such as this, is it the case that one opinion is right and one is wrong?
 R: No. I think it just depends on how you feel personally.

Justification of Beliefs

- I: When people differ about matters such as this, is it the case that one opinion is right and one opinion is wrong?
- R: Not necessarily, because people make their decisions based upon how they feel and what research they've seen. So what one person thinks is right, another person might think is wrong; but that doesn't make it wrong. It has to be a personal decision. If I feel that chemicals cause cancer and you feel that food is unsafe without [them], your opinion might be right to you and my opinion is right to me.
- I: Could we ever say that one opinion is better and one is worse?
- R: I don't think so.
- I: Can you tell me why not?
- R: Just because the opinion that a person has is based upon what he believes, and so you wouldn't be able to say that one person's opinion is better than another's because it's just an opinion.

Students who reason using quasi-reflective assumptions recognize that knowledge claims contain elements of uncertainty due to missing information or to differences or errors in data-gathering methods. They use evidence in decision making, but inconsistently, and often appear confused about how evidence thus seen as uncertain can be used to reach a conclusion. They tend to view judgments as highly idiosyncratic and to be very skeptical of attempts to evaluate judgments and other "opinions." This skepticism may be seen as they try to understand faculty grading of essays or other "subjective" papers.

Example of Reflective Thinking*Certainty of Knowledge*

- I: How is it that experts, two chemists, for example, might disagree about this issue?
- R: Because our research sciences are not exact, because there are differences in controls used, differences in intensities of materials, and so on, as well as differences in interpretation.
- I: And I also heard you say [earlier] that you would take this point of view as being the best you could do right now.
- R: Right. I still can't accept that I could be absolutely one hundred percent positive, especially if I just looked in one journal, or two journals, or even five or ten. If I were a chemist and conducted the experiments, I might know even more than I could know now. This is what I'm finding out. The more education I get, the more uncertain I am about things. . . . But when it comes down to a point of food additives, or specific food additives, you do need to operate on what you think is best at the time, the best information you can get, and act accordingly.

Justification of Beliefs

I: How would you define the "better" option?

R: One that takes as many factors as possible into consideration. I mean one that uses the [highest] percentage of the data that we have, and perhaps that uses the methodology that has been most reliable.

I: And how did you come to your conclusions as to what the evidence suggests?

R: I think you have to take a look at the different opinions and studies that are offered by different groups. Maybe some studies offered by the chemical industry, some studies by the government, and some private studies—a variety of studies from a variety of different areas. You wouldn't trust, for instance, a study funded by the tobacco industry that proved cigarette smoking is not harmful. You wouldn't base your point of view entirely upon that study. Things like that have to be taken into account also. Because unfortunately, when you get into the area of money, making money and making a profit, not only do you have to interpret the scientific evidence, but you have to try to interpret people's motives also, and that makes it an even more complex soup to try to strain out.

People who reason using reflective thinking assumptions accept uncertainty in decision making but are not immobilized by it. They are willing to endorse conclusions as "most reasonable" and about which they are "reasonably certain." These conclusions are explicitly based on their evaluation of the available data. They believe that knowledge claims must be evaluated in relation to the context in which they were generated to determine their validity; that any claim should be reevaluated in light of new data, new methodologies, and new perspectives on the question; and that they must actively construct their own decisions.

Each of these three pairs of examples illustrates how the way a student reasons about a controversial or vexing problem is related to his or her epistemological assumptions. Each successive level is more complex, reflecting both sophistication and appreciation for subtlety in reasoning skills. More specifically, the relationship between evidence and judgment becomes more explicit and more salient across levels.

These brief descriptions of the three major categories of reflective thinking are drawn from a much more detailed seven-stage model of Reflective Judgment. For a full description of the stages (and for a description of the "complex stage" model that defines their use of the term "stage," see King and Kitchener's compendium of Reflective Judgment theory, research, and practice (1994). All seven stages of the Reflective Judgment Model are summarized in Exhibit 2.1.

Exhibit 2.1. Summary: The Seven Stages of Reflective Judgment**Prereflective Thinking (Stages 1, 2, and 3)****Stage 1**

View of knowledge: Knowledge is assumed to exist absolutely and concretely; it is not understood as an abstraction. It can be obtained with certainty by direct observation.

Concept of justification: Beliefs need no justification since there is assumed to be an absolute correspondence between what is believed to be true and what is true. Alternate beliefs are not perceived.

"I know what I have seen."

Stage 2

View of knowledge: Knowledge is assumed to be absolutely certain or certain but not immediately available. Knowledge can be obtained directly through the senses (as in direct observation) or via authority figures.

Concept of justification: Beliefs are unexamined and unjustified or justified by their correspondence with the beliefs of an authority figure (such as a teacher or parent). Most issues are assumed to have a right answer, so there is little or no conflict in making decisions about disputed issues.

"If it is on the news, it has to be true."

Stage 3

View of knowledge: Knowledge is assumed to be absolutely certain or temporarily uncertain. In areas of temporary uncertainty, only personal beliefs can be known until absolute knowledge is obtained. In areas of absolute certainty, knowledge is obtained from authorities.

Concept of justification: In areas in which certain answers exist, beliefs are justified by reference to authorities' views. In areas in which answers do not exist, beliefs are defended as personal opinion since the link between evidence and beliefs is unclear.

"When there is evidence that people can give to convince everybody one way or another, then it will be knowledge; until then, it's just a guess."

Quasi-Reflective Thinking (Stages 4 and 5)**Stage 4**

View of knowledge: Knowledge is uncertain and knowledge claims are idiosyncratic to the individual since situational variables (such as incorrect reporting of data, data lost over time, or disparities in access to information) dictate that knowing always involves an element of ambiguity.

Concept of justification: Beliefs are justified by giving reasons and using evidence, but the arguments and choice of evidence are idiosyncratic (for example, choosing evidence that fits an established belief).

"I'd be more inclined to believe evolution if they had proof. It's just like the pyramids: I don't think we'll ever know. Who are you going to ask? No one was there."

Stage 5

View of knowledge: Knowledge is contextual and subjective since it is filtered through a person's perceptions and criteria for judgment. Only interpretations of evidence, events, or issues may be known.

Concept of justification: Beliefs are justified within a particular context by means of the rules of inquiry for that context and by context-specific interpretations of evidence. Specific beliefs are assumed to be context specific or are balanced against other interpretations, which complicates (and sometimes delays) conclusions.

"People think differently and so they attack the problem differently. Other theories could be as true as my own, but based on different evidence."

Reflective Thinking (Stages 6 and 7)

Stage 6

View of knowledge: Knowledge is constructed into individual conclusions about ill-structured problems on the basis of information from a variety of sources. Interpretations that are based on evaluations of evidence across contexts and on the evaluated opinions of reputable others can be known.

Concept of justification: Beliefs are justified by comparing evidence and opinion from different perspectives on an issue or across different contexts and by constructing solutions that are evaluated by criteria such as the weight of the evidence, the utility of the solution, or the pragmatic need for action.

"It's very difficult in this life to be sure. There are degrees of sureness.

You come to a point at which you are sure enough for a personal stance on the issue."

Stage 7

View of knowledge: Knowledge is the outcome of a process of reasonable inquiry in which solutions to ill-structured problems are constructed. The adequacy of those solutions is evaluated in terms of what is most reasonable or probable according to the current evidence, and it is reevaluated when relevant new evidence, perspectives, or tools of inquiry become available.

Concept of justification: Beliefs are justified probabilistically on the basis of a variety of interpretive considerations, such as the weight of the evidence, the explanatory value of the interpretations, the risk of erroneous conclusions, consequences of alternative judgments, and the interrelationships of these factors. Conclusions are defended as representing the most complete, plausible or compelling understanding of an issue on the basis of the available evidence.

"One can judge an argument by how well thought-out the positions are, what kinds of reasoning and evidence are used to support it, and how consistent the way one argues on this topic is as compared with other topics."

Source: King, P. M., and Kitchener, K. S. (1994). *Developing Reflective Judgment*. pp. 14-16. Reprinted by permission of Jossey-Bass, Inc., a division of John Wiley & Sons, Inc.

Research on the Development of Reflective Judgment

The verbatim examples given earlier represent a range of reflective judgment levels. Which are the most common sets of assumptions among college students? Do they vary by educational level? How does reflective judgment relate to other aspects of development? Fortunately, the Reflective Judgment Model has an extensive research base gathered over the past twenty years to inform these questions.

King and Kitchener (1994) reported the results of dozens of studies on the development of reflective judgment. Wood (1997) conducted a comprehensive secondary analysis of data from more than two thousand individuals in all previously reported studies. Longitudinal studies have consistently shown upward changes in reflective judgment over time, especially among individuals involved in educational endeavors. Further, these changes generally followed the posited sequence of stages, with higher-stage usage following lower-stage usage.

Educational level is strongly associated with reflective thinking; a clear, developmental progression may be observed in the reflective judgment

scores from high school to college, from the first year to the senior year of college, from college to graduate school, and from early (master's degree) to advanced (third-year doctoral) graduate programs. Since teaching reasoning skills such as the development, analysis, and critique of knowledge claims is a commonly cited educational goal for many colleges and universities, many educators find this clear progression reassuring evidence of their success. Indeed, the finding of significant differences between the scores of the freshmen and seniors suggests that important shifts in epistemological assumptions are occurring during the college years. Specifically, the senior scores reflect an acceptance of uncertainty as a natural part of the knowing process; they also reflect movement from beliefs based on "what feels right" or "what I want to believe" to beliefs based (at least partly) on evidence. Kroll (1992) termed this type of developmental progression the abandonment of "ignorant certainty" in favor of "intelligent confusion." Many seniors also show deeper understanding of different points of view, such as how one's perspective affects the kinds of data one gathers and which data one weighs more heavily.

However, this assessment of educational progress tells only part of the story. The reflective judgment scores of most college students show that their reasoning reflects the assumptions of quasi-reflective thinking, not reflective thinking. Among the student samples, only the advanced doctoral students have consistently reasoned reflectively. While "intelligent confusion" appears to be an important step toward reflective thinking, it is not the aim of undergraduate education.

Reflective judgment also appears to be related to other dimensions of development, including moral reasoning and reasoning about diversity issues (King and Shuford, 1996). Several studies (summarized in King and Kitchener, 1994) have found a moderate positive relationship between the kinds of assumptions students use to reason about intellectual issues (their epistemological assumptions) and the assumptions they use to reason about moral issues (their assumptions about what is right, fair, and good). Guthrie, King, and Palmer (1999) found moderate positive correlations between reflective thinking and tolerance for diversity. More strikingly, the reflective judgment scores accounted for almost half of the variance in tolerance scores: participants in this study who reasoned at quasi-reflective and reflective thinking levels were much more likely to hold tolerant viewpoints with respect to race and sexual orientation than their counterparts who held prereflective assumptions.

King and Howard-Hamilton (1999) found that the development of multicultural competence also appears to parallel development in reflective thinking. They asked a sample of diversity education experts to describe early, middle, and advanced levels of multicultural competence. The experts' descriptions of these levels mirrored the assumptions of prereflective, quasi-reflective, and reflective thinking, respectively. It may be that there is a cognitive component underlying the development of multicultural competence—for example, that being able to think reflectively is a precursor to being able to apply

those skills to one's addressing and understanding multicultural issues. If so, this would be further evidence of interdependence among supposedly distinct aspects of development.

Findings like these about relationships across areas of development are important for educators to understand because they remind us that development evolves holistically, that assisting college students to achieve their educational goals involves several interrelated elements, not just reasoning skills. Unfortunately, these elements are often addressed discretely. For example, faculty members often see their teaching role as challenging and sharpening the intellect. Concomitantly, they often presume that the responsibility for challenging and fostering other aspects of development (such as character or sense of identity) lies with others, such as parents or student affairs staff. I refer to this peculiar distribution of educational responsibilities as the "cut them off at the neck" approach, which is ill-founded for a variety of reasons. For example, there is plentiful evidence not only that major aspects of development are interrelated but also that poorly developed skills in one area of development can inhibit competence in other areas (Kegan, 1994; King and Baxter Magolda, 1996; Kitchener, 1982). Many faculty have witnessed good students performing poorly on oral reports because they lack the confidence to speak in front of their peers or submitting "wishy-washy" opinion or editorial essays because they do not consider themselves smart enough to offer their own opinions. A student who appreciates why people approach controversial issues in her discipline from different perspectives is more likely to see and appreciate the reasons people approach social controversies from different perspectives. By the same token, a student who evaluates knowledge claims in his major by reference to the strength of the evidence in support of conflicting hypotheses would also be more inclined to evaluate contradictory claims about current moral issues by reference to the weight of the available evidence.

Many good teachers have long been aware of the developmental evolution of complex reasoning, and of the interrelationships among cognitive, moral, and identity development. These research findings provide strong evidence for their observations.

Creating Contexts That Help Students Think Reflectively

"In the final analysis, the challenge of college, for students and faculty members alike, is empowering individuals to know that the world is far more complex than it first appears, and that they must make interpretive arguments and decisions—judgments that entail real consequences for which they must take responsibility and from which they may not flee by disclaiming expertise" (Association of American Colleges, 1991, pp. 16–17).

How can faculty help students learn to make good interpretive arguments and decisions? Three major factors discussed here appear to be at the

heart of this undertaking: understanding the knowing process in more complex and encompassing ways, accepting uncertainty without being immobilized by it, and learning to use evidence to reason to conclusions and make "best judgments." Teachers whose goals are to help students become more effective at constructing their own beliefs and knowledge claims about the world in which they live and more comfortable with their roles and responsibilities in doing so must abandon the "I pitch, you catch" view of knowledge acquisition. This approach—however commonly practiced—fails to take into account students' epistemological assumptions, their role in interpreting information, and the uncertainty in judgment making, and it is therefore ineffective in teaching students how to make reflective judgments.

Several authors have offered suggestions for promoting reflective thinking that address these factors (Davison, King, and Kitchener, 1990; King, 1992; King and Baxter Magolda, 1996; Kitchener and King, 1990; King and Wood, 1999; Kitchener, King, Wood, and Lynch, 1994; Kitchener, Lynch, Fischer, and Wood, 1993; Kroll, 1992; Kronholm, 1996; Lynch, Kitchener, and King, 1994; Wolcott and Lynch, 1997; Wood and Lynch, 1998). King and Kitchener (in press, p. 25) identified the following common suggestions from these works:

1. Show respect for students' assumptions, regardless of the developmental stage(s) they exhibit. Their assumptions are genuine and sincere reflections of their ways of making meaning, and are steps in a developmental progression. If students perceive disrespect or lack of emotional support, they may be less willing to engage in challenging discussions or to take the intellectual and personal risks required for development.

2. Discuss controversial, ill-structured issues with students throughout their educational activities, and make available resources that show the factual basis and lines of reasoning for several perspectives.

3. Create many opportunities for students to analyze *others'* points of view for evidentiary adequacy and to develop and defend their *own* points of view about controversial issues.

4. Teach students strategies for systematically gathering data, assessing the relevance of the data, evaluating data sources, and making interpretive judgments based on the available data.

5. Give students frequent feedback, and provide both cognitive and emotional support for their efforts.

6. Help students explicitly address issues of uncertainty in judgment making and examine their assumptions about knowledge and how it is gained.

7. Encourage students to practice their reasoning skills in many settings, from their other classes to their practicum sites, student organizations, residence hall councils, and elsewhere, to gain practice and confidence applying their thinking skills (p. 25).

These suggestions presume that teachers endorse reflective thinking as an educational goal and that they apply these skills to their own decision

making. However, consider the following comment made during a radio interview by a Kansas teacher in support of the 1999 Kansas State Board of Education's decision not to require the teaching of evolution in the science curriculum: "As teachers, we have an obligation to teach students the facts. Evolution is a theory, and that's a fact." Apparently, students are not the only ones who appear to be confused about the relationship between facts, theories, and interpretations.

The suggestions for promoting reflective thinking are grounded in the assumption that teachers are effective when they are good guides (Kegan, 1994; Palmer, 1998) for students' epistemological and personal learning journeys. Kroll (1992) modeled this guiding role in the ways he encouraged students to think more reflectively: "When their responses are dogmatic, I foster all their doubts; when they seem mired in skepticism or paralyzed by complexity, I push them to make judgments; when their tactics are not fully reflective, I encourage their best efforts to use critical, evaluative thinking" (p. 13). This practice shows an underlying respect for students regardless of their level of intellectual development; it acknowledges that the journey is each student's journey and that the teacher's role as guide is to choose responses that are adapted to the student's needs. Through respectful but challenging interactions like these, interactions that take account of students' epistemological assumptions, teachers can promote reflective thinking.

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